

IN THE CLAIMS:

1. (Currently Amended) A piezo-electric ceramic transducer which bends in a thickness direction thereof by applying voltage to the transducer, the transducer comprises:

two-piezo-electric active layers having at least one piezo-electric layer respectively, said piezo-electronic ~~electric~~ active layers being applied ~~voltages~~ voltages via electrode layers so that one of said piezo-electric active layer expands and the other one contracts,

an intermediate insulating layer disposed between said two piezo-electronic ~~electric~~ active ~~layer~~ layers,

two surface insulating layers, ~~between~~ between which said two piezo-electric active layers are placed, disposed on both surfaces of said piezo-electric ceramic transducer in a thickness direction thereof,

electrode pads disposed on only one of said two surface insulating layers and electrically connected with said electrode layers, and

wherein said piezo-electric active layers, said intermediate layer and said surface insulating layers are made of the same material as one another and are integrated with one another by sintering.

2. (Original) The piezo-electric ceramic transducer according to claim 1, wherein said piezo-electric active layers have a plurality of piezo-electric layers separated from one another by said electrode layers.

3. (Cancelled)

4. (Currently Amended) The piezo-electric ceramic transducer according to claim 1, wherein ~~[[of]]~~ said two piezo-electric active layers are ~~[[in]]~~ polarized so that polarization directions of said piezo-electric ~~active~~ electric layers which are most adjacent to each other in relation between one of said piezo-electric active layer and the other of said piezo-electric active layer is the same direction to each other.

5. (Original) The piezo-electric ceramic transducer according to claim 4, wherein two electrode layers adjacent to each other through said intermediate insulating layer among said electrode layers are electrically short-circuited, and said piezo-electric active layers being electrically connected with each other in parallel.

6. (Currently Amended) ~~The piezo-electric ceramic transducer according to claim 1,~~ A piezo-electric ceramic transducer which bends in a thickness direction thereof by applying voltage to the transducer, the transducer comprises:

two-piezo-electric active layers having at least one piezo-electric layer respectively, said piezo-electric active layers being applied voltages via electrode layers so that one of said piezo-electric active layer expands and the other one contracts,

an intermediate insulating layer disposed between said two piezo-electric active layers,

two surface insulating layers, between which said two piezo-electric active layers are placed, disposed on both surfaces of said piezo-electric ceramic transducer in a thickness direction thereof,

electrode pads disposed on only one of said two surface insulating layers and electrically connected with said electrode layers,

wherein said piezo-electric active layers, said intermediate layer and said surface insulating layers are made of the same material as one another and are integrated with one another by sintering, and wherein the electrode pad comprises[[;]],

two first pad portions for polarization electrically connected with said electrode layer of one of said piezo-electric active layers, and two second pad portions for polarization electrically connected with said electrode layer of the other piezo-electric active layer, said first and second pad portions being used in a polarization process for said piezo-electric layers; and

a coupling portion for coupling the first pad portions with the second pad portions.

7. (Previously presented) The piezo-electric ceramic transducer according to claim 1, further comprising an elastic body joined to at least one of said two surface insulating layers.

8. (Previously presented) The piezo-electric ceramic transducer according to claim 7, wherein said elastic body is joined to one of said surface insulating layer, on which said electrode pads are not disposed, among said surface insulating layers.

9. (Previously presented) The piezo-electric ceramic transducer according to claim 1, wherein a part of said piezo-electric ceramic transducer is fixed to an elastic body via a stationary part, a displacement of said elastic body at a position which said stationary part is fixed is smaller than a maximum displacement of the piezo-electric ceramic transducer.

10. (Previously presented) The piezo-electric ceramic transducer according to claim 9, wherein said stationary part is attached to a position different from a center in a longitudinal direction of said piezo-electric ceramic transducer.

11. (Currently Amended) ~~The piezo-electric ceramic transducer according to claim 9, A~~
piezo-electric ceramic transducer which bends in a thickness direction thereof by
applying voltage to the transducer, the transducer comprises:

two-piezo-electric active layers having at least one piezo-electric layer
respectively, said piezo-electric active layers being applied voltages via electrode layers
so that one of said piezo-electric active layer expands and the other one contracts,

an intermediate insulating layer disposed between said two piezo-electric active
layers,

two surface insulating layers, between which said two piezo-electric active layers
are placed, disposed on both surfaces of said piezo-electric ceramic transducer in a
thickness direction thereof,

electrode pads disposed on only one of said two surface insulating layers and
electrically connected with said electrode layers.

wherein said piezo-electric active layers, said intermediate layer and said surface insulating layers are made of the same material as one another and are integrated with one another by sintering, and wherein a part of said piezo-electric ceramic transducer is fixed to an elastic body via a stationary part, a displacement of said elastic body at a position which said stationary part is fixed is smaller than a maximum displacement of the piezo-electric ceramic transducer, and wherein said elastic body is a box, and said piezo-electric ceramic transducer is attached to an inside portion of said box.

12. (Original) A portable device comprising:

a piezo-electric ceramic transducer claimed in claim 1, and

a part, joined to said piezo-electric ceramic transducer, to which displacement of said piezo-electric ceramic transducer is transmitted.

13. (Currently Amended) A portable device comprising:

~~a piezo-electric ceramic transducer claimed in claim 1,~~

a piezo-electric ceramic transducer which bends in a thickness direction thereof
by applying voltage to the transducer, the transducer comprises:

two-piezo-electric active layers having at least one piezo-electric layer respectively, said piezo-electric active layers being applied voltages via electrode layers so that one of said piezo-electric active layer expands and the other one contracts,

an intermediate insulating layer disposed between said two piezo-electric active layers,

two surface insulating layers, between which said two piezo-electric active layers are placed, disposed on both surfaces of said piezo-electric ceramic transducer in a thickness direction thereof.

electrode pads disposed on only one of said two surface insulating layers and electrically connected with said electrode layers,

wherein said piezo-electric active layers, said intermediate layer and said surface insulating layers are made of the same material as one another and are integrated with one another by sintering,

a stationary part attached to said piezo-electric ceramic transducer,

an elastic body, joined to said stationary part, which makes a displacement of said stationary part to become smaller than a displacement of said piezo-electric ceramic transducer at an end of said piezo-ceramic transducer, and

wherein an acoustical radiation is generated from said elastic body.

14. (Original) The portable device according to claim 13, wherein said elastic body is a case body of the portable device.

15. (Currently Amended) The portable device according to ~~claims~~ claim 13, wherein said stationary part is attached to a position different from a position of a center of said piezo-electric ceramic transducer.

16. (Currently Amended) The piezo-electric ceramic transducer according to claim 8, ~~wherein~~ wherein said stationary part is attached to a position different from ~~[[a]]~~ center

and end portions in a ~~longitudinally~~ longitudinal direction of said piezo-~~electronic~~ electric ceramic transducer.